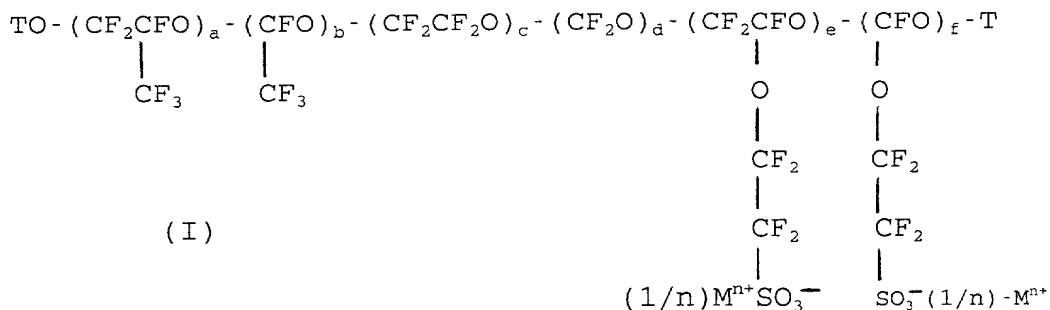


CLAIMS

1. Electrolytic compositions comprising a perfluoropolyether additive of formula (I):



wherein:

d,e,f are integers; a,b,c can be zero or integers; said units being statistically distributed along the chain, a+b+c+d+e+f such that the number average molecular weight ranges from 500 to 5×10^5 , preferably from 1,000 to 50,000;

T are end groups selected from $-\text{CF}_2\text{X}$ ($\text{X}=\text{F}, \text{CF}_3, \text{Cl}$),

$-\text{C}_3\text{F}_7$, $-\text{CF}(\text{CF}_3)\text{COO}^- (1/n)\text{M}^{n+}$, $-\text{CF}_2\text{COO}^- (1/n)\text{M}^{n+}$,

$-\text{CF}_2\text{C}(\text{O}(1/n)\text{M}^{n+})_2\text{CF}_3$;

M^{n+} is a cation having valence $n=1-4$ selected from Li^+ ,

Na^+ , K^+ , Cs^+ , Mg^{2+} , Ca^{2+} , Sr^{2+} , Ba^{2+} , metal cations of the

group IIIA such as Al^{3+} ; transition metal cations, such

as Fe^{2+} , Fe^{3+} , Zn^{2+} , Ti^{4+} , Cu^{2+} ;

tetraalkylammonium NR_4^+ cations, trialkylammonium NR_3^+

cations, wherein R is selected from H, a linear or

branched when possible C_1 - C_4 lower alkyl.

cations, wherein R is selected from H, a linear or branched when possible C₁-C₄ lower alkyl.

2. Electrolytic compositions according to claim 1, wherein Mⁿ⁺ is a monovalent cation (n=1), preferably M=Li⁺.
3. Electrolytic compositions according to claims 1-2, furthermore comprising:
 - one or more aprotic polar solvents;
 - a conductive salt.
4. Electrolytic compositions according to claim 3, wherein the conductive salt cation is selected from the group comprising alkaline, alkaline-earth metals, trivalent metals, tetra-alkylammonium; the anion is selected from: PF₆⁻, ClO₄⁻, AsF₆⁻, BF₄⁻, (R_{f1}SO₂)(R_{f2}SO₂)N⁻, R_{fV}SO₃⁻ wherein R_{f1}, R_{f2}, R_{fV} are independently selected from C₁-C₄ perfluoroalkyl groups optionally containing heteroatoms.
5. Electrolytic compositions according to claims 3-4, wherein the aprotic polar solvents are selected from 1,2-dimethoxyethane, 1,2-diethoxyethane, 1,3-dioxolane, 2-methyl-1,3-dioxolane, 4-methyl-1,3-dioxolane, tetrahydrofuran, 2-methyltetrahydrofuran, 1,4-dioxane, N,N-dimethylformamide, dimethylsulphoxide, ester carbonates such as dimethylcarbonate, diethylcarbonate, propylenecarbonate, ethylencarbonate.

6. Electrolytic compositions according to claim 5, wherein the solvents are ester carbonates.
7. Electrolytic compositions according to claims 1-6, wherein the concentration of conductive salt in the electrolytic solution is higher than 0.5 moles/litre, preferably in the range 0.5-2 moles/litre.
8. Electrolytic compositions according to claims 1-7, wherein the concentration of the perfluoropolyether additive is higher than 10 meq/litre (calculated as cation M^{n+}), preferably in the range 10 meq/litre-500 meq/litre.
9. Electrolytic compositions according to claims 1-8, wherein the ionic species are at least partially dissolved or dispersed in a matrix material.
10. Electrolytic compositions according to claim 9, wherein the matrix material is in the form of solid, liquid polymer, gel or porous membrane.
11. Electrolytic compositions according to claims 9-10, wherein the matrix material in the form of solid polymer is selected from polyethylenoxide, polyesters, polyacrylates, polyvinylidenefluoride, polyacrylonitrile.
12. Electrolytic compositions according to claims 9-11, wherein the matrix material in the form of porous solid

membranes is selected from polyethylene, polypropylene having a surface tension in the range 28-35 mN/m (dyne/cm).

13. Electrolytic compositions according to claims 1-12, wherein the perfluoropolyether additive of formula (I) is obtainable by conversion of the fluorosulphonyl groups $\text{-SO}_2\text{F}$ into $\text{-SO}_3\text{M}$ groups carried out on the homopolymers of the monomer $\text{CF}_2=\text{CFOCF}_2\text{CF}_2\text{SO}_2\text{F}$ or on the copolymers of said monomer with perfluoroolefins.
14. Electrolytic compositions according to claim 13, wherein the perfluoroolefins are tetrafluoroethylene and/or perfluoropropene.
15. Use of the electrolytic compositions according to claims 1-14, in electrochemical systems, such as lithium batteries.
16. Electrochemical system comprising the electrolytic compositions according to claims 1-14.
17. Perfluoropolyether additives according to claims 1-2.